PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
CRT1658

CD MECHANISM UNIT

CX-633

COMPACT disc DIGITAL AUDIO

- **This service manual describes operation of the CD mechanism incroporated in models listed in the table below.**
- **When performing repairs use this manual together with the specific manual for model under repair.**

Model	Service Manual	CD Mechanism Unit
CDX-P1210/UC,EW,ES	CRT1659	CXK4100

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1. DISASSEMBLY

● PU Unit Removal

When removing the connector to the PU unit, attach a short pin from the PU unit to the flexible circuit board.

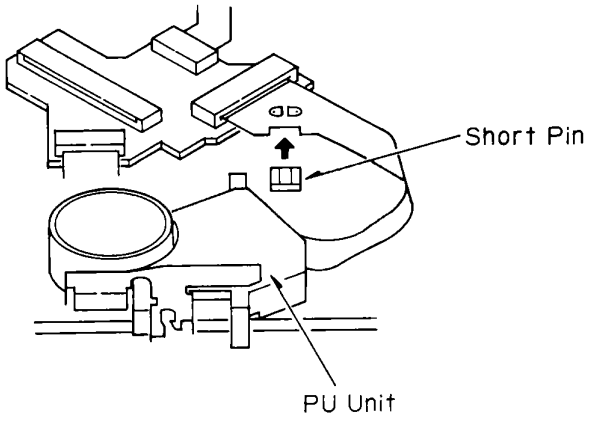

Fig.1

1. Remove the flexible circuit board from the connector.
2. Stretch the spring and hook it on the protrusion.
3. Undo the screw and remove the spring A.

NOTE: When assembling the PU unit, assemble so that section A clamps the shaft.

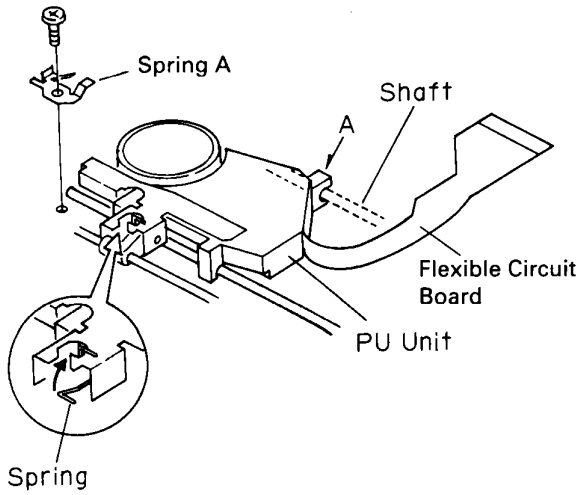

Fig.2

● Carriage Motor Assy Removal

1. Remove the screw, spring, belt, screw unit, and then remove the carriage motor assy.

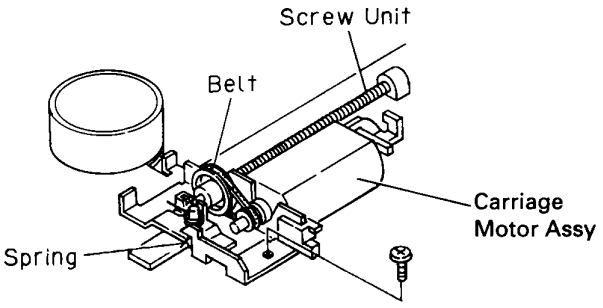

Fig.3

● Spindle Motor Removal

1. Undo the seven screws A, and then remove the frame and arm.
2. Undo the six screws B, and then remove the side frame.
3. Run the tray motor to and set the carriage mechanism to play (carriage mechanism lock is released).

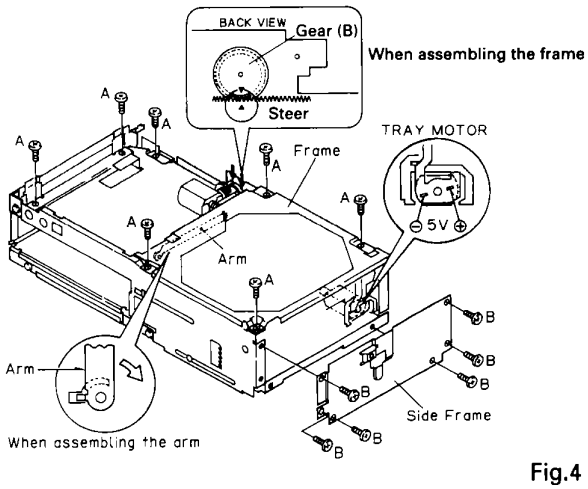

Fig.4

NOTE:

When assembling the frame, place the gear shaft with the arrow mark in the chassis, and align the ▲ mark of the steering to the ▲ of the gear B.

To assemble the arm, stand it upright and place it in the installation hole of the stage. Push it down towards the right and place the other end in the hole of the frame.

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4. Turn the mechanism to its rear.
5. Remove the two springs; remove the clamper arm and spacer.

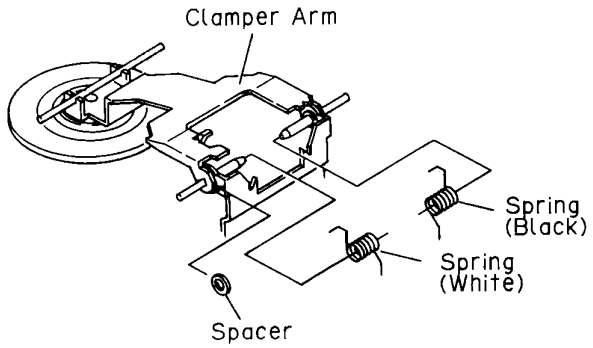

Fig.5

6. Face the mechanism forward.
7. Undo the six screws and remove the carriage mechanism assy.

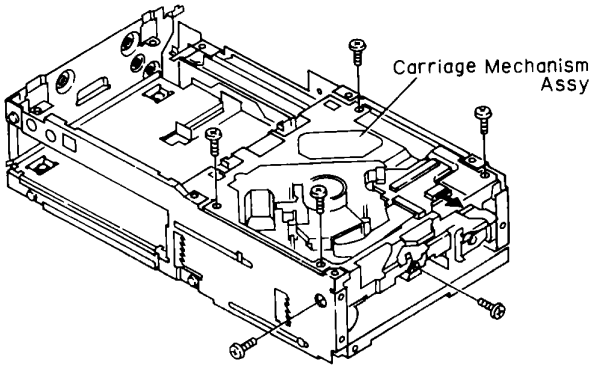

Fig.6

8. Remove the spring and side pressure arm.
   If the side pressure arm is difficult to remove, turn the cam in the direction of the arrow, flip the disc clamper up, and then remove the side pressure arm.
9. Undo the two screws and remove the spindle motor.

NOTE: When assembling the motor, tighten the screws at the position (angle) where the motor's lead wires reach the circuit board.

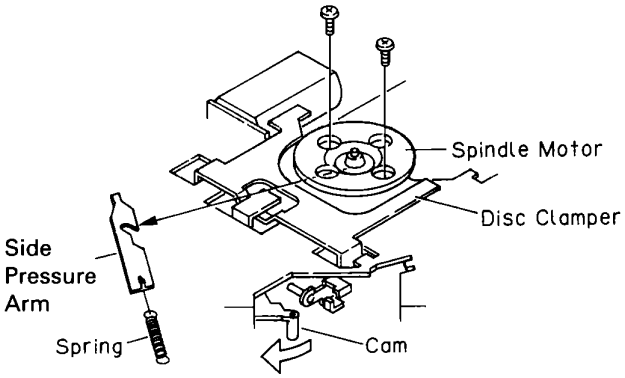

Fig.7

● Tray Motor Removal

1. Turn the mechanism to its rear.
2. Undo the one screw and remove the tray motor unit.

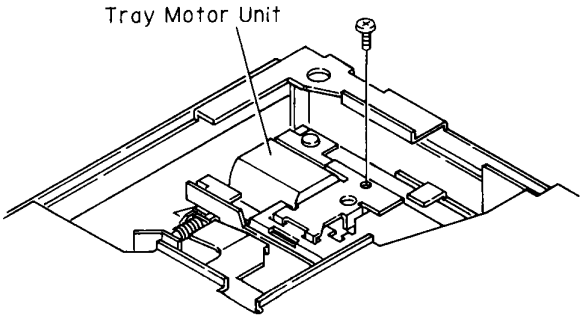

Fig.8

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● Magazine Holder Removal

1. Turn the tray motor to set the mechanism at the area halfway between play and stop.
2. Undo the four screws and remove the magazine holder.

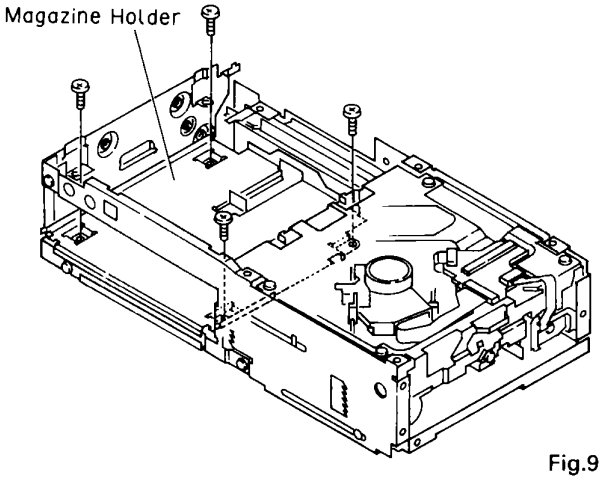

Fig.9

● Meshing of Gears When Assembling (fig. shows top view of mechanism)

Cam ring is turned all the way in the counter-clockwise direction.

1. Tray extraction gear section

A) Intermittent gear

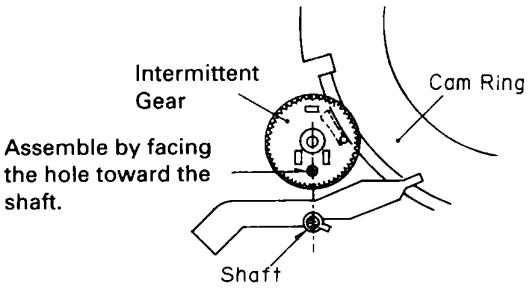

Fig.10

B) Acceleration gear

Assemble by overlapping the holes of the intermittent gear and acceleration gear.

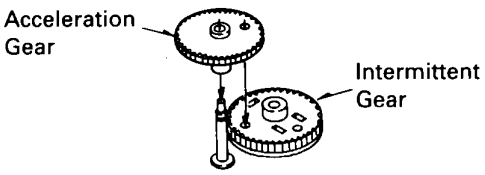

Fig.11

C) Idler gear

Assemble so that the tooth of the acceleration gear with the △ mark meshes with the valley of the idler gear with the △ mark.

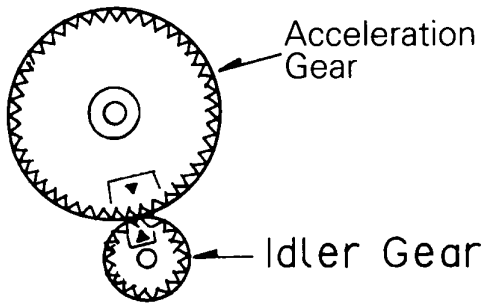

Fig.12

D) Tray gear

Assemble so that the tooth of the idler gear with the ○ mark meshes with the valley of the tray gear with the ○ mark. Also, assemble so that the valley of the tray gear with the △ mark meshes with the last tooth at the end of the tray extraction lever's rack.

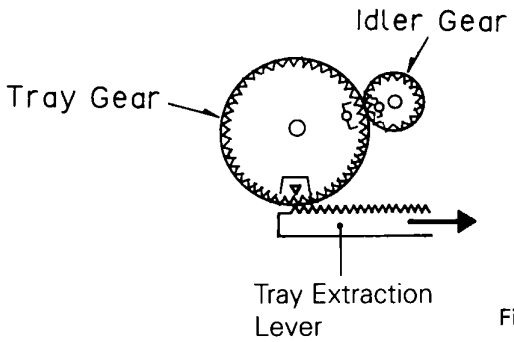

Fig.13

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2. MECHANISM DESCRIPTION

● Magazine Insertion

1. When the magazine is inserted against the force of the eject lever's spring, the eject lever pushes the tip of the magazine SW arm directly before the magazine lock position, causing the arm to swing. This in turn causes the part where the magazine lock arm and magazine SW arm overlap to separate, with the magazine lock arm swinging upward.

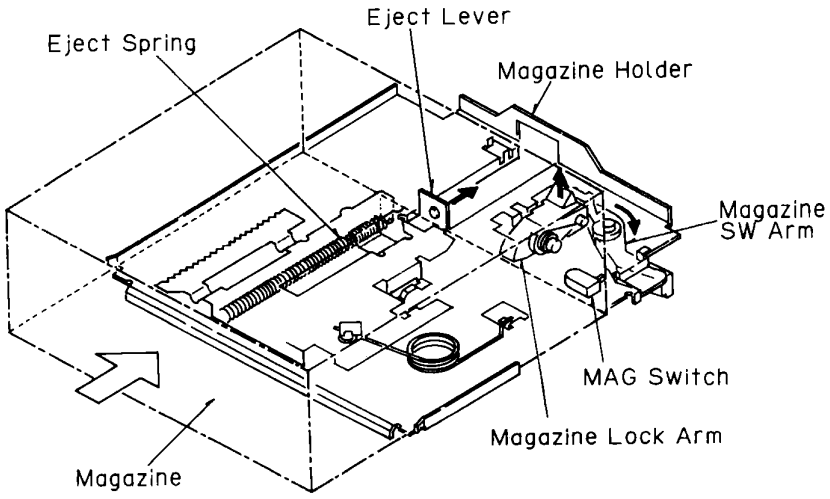

Fig.14

2. If the magazine is inserted up to the lock position, the catch of the lock arm enters the magazine's lock slot, thus locking the magazine. The tapered part of the tip of the magazine lock arm pushes the magazine SW arm, thus tripping the MAG switch.

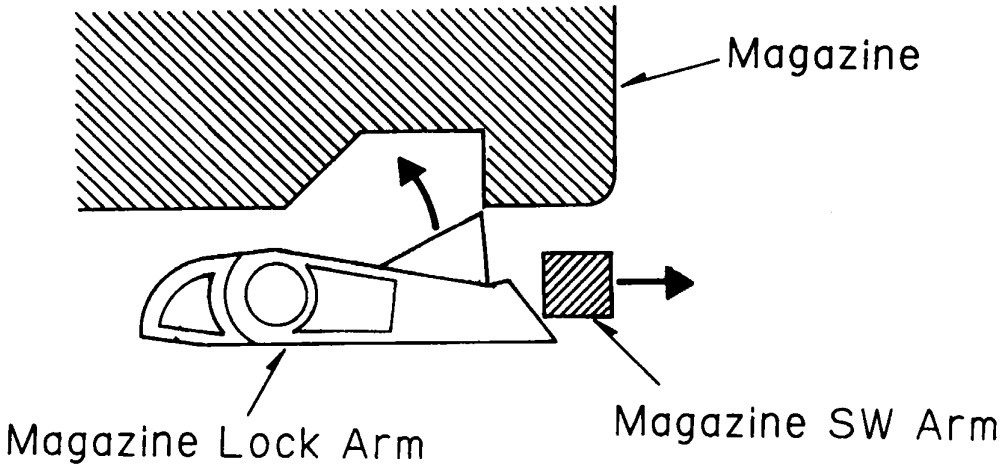

Fig.15

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● Disc Clamp Operation

1. When the MAG switch is tripped, the tray motor turns and rotates the cam ring. When the cam ring rotates, the tray extraction intermittent gear and tray gear are rotated via the cam ring, causing the tray extraction lever to slide. The tray is then drawn out by the tray extraction lever.

View from below with the stage lower cover removed

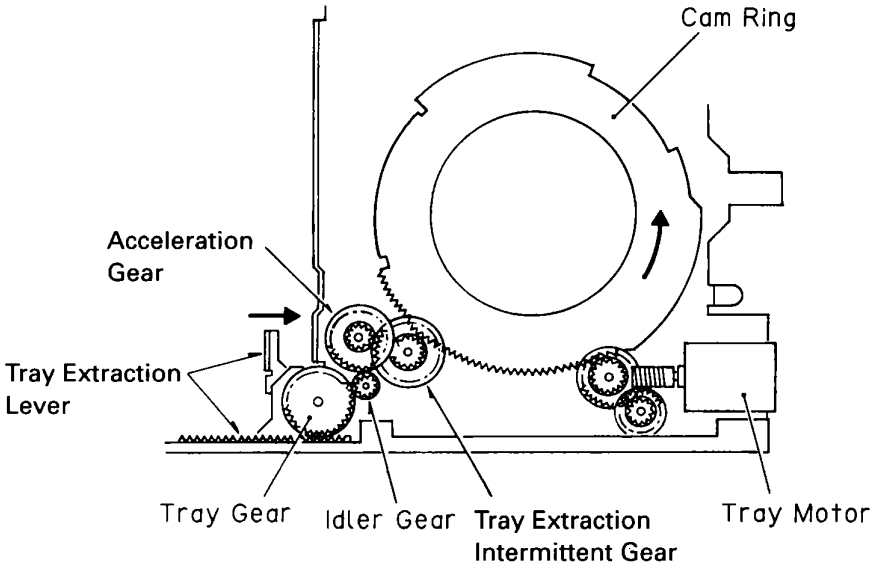

Fig.16

2. After the tray is drawn out, if using an 8 cm disc, the fingers of the disc clamper are released.

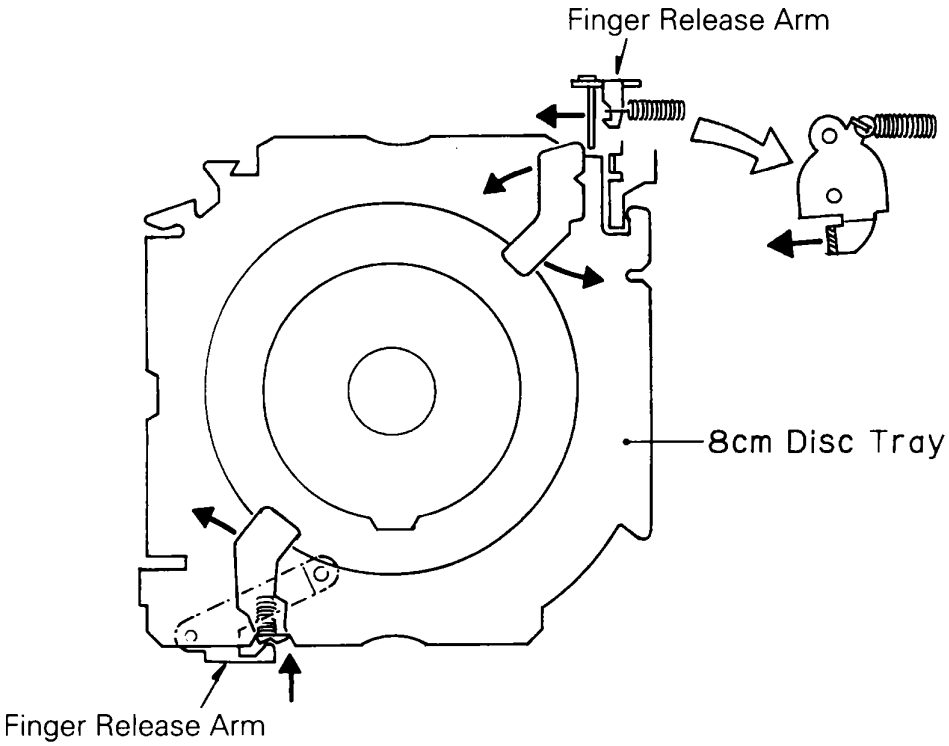

Fig.17

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3. When the disc holder fingers have been released, the clamper arm rises and clamps the disc.

3-1. As the lever retaining the shaft at the tip of the clamper arm slides and escapes, the curved part of the cam ring simultaneously retains the shaft, and the spring-activated clamper arm rises.

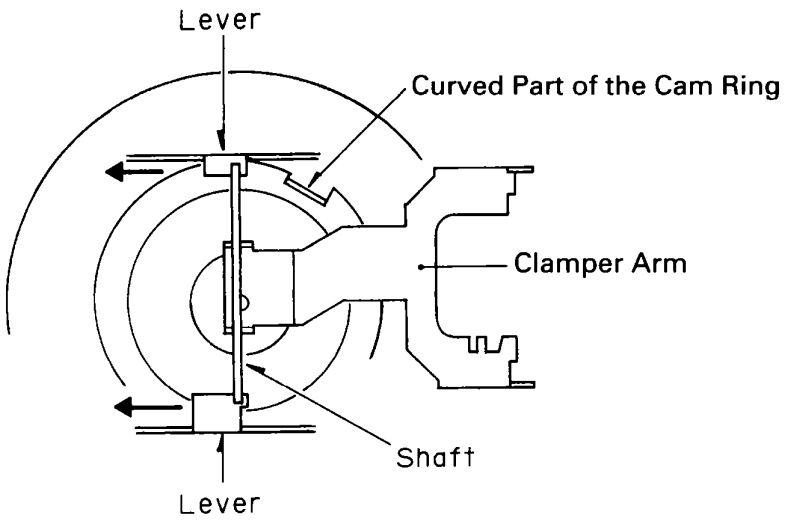

Fig.18

3-2. At the same time the disc clamp performs this action, the clamp and the large and small disc holder arms clamp the disc.

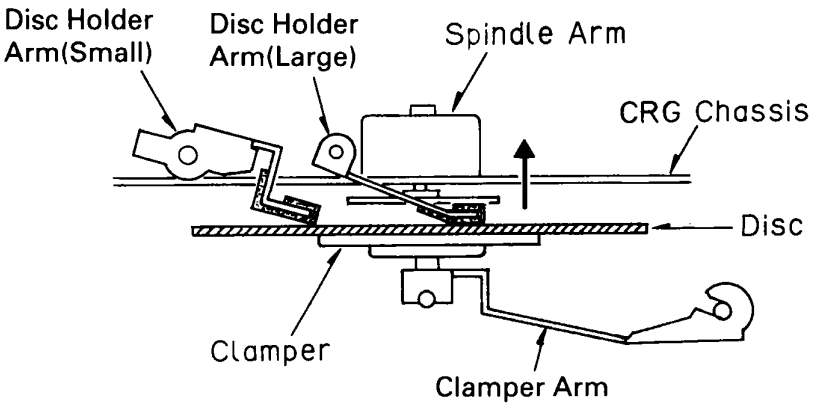

Fig.19

3-3. The large and small disc holder arms are moved up and down by the turning of the disc holder cam. The cam turns while being clamped by the curved part of the CRG lock lever.

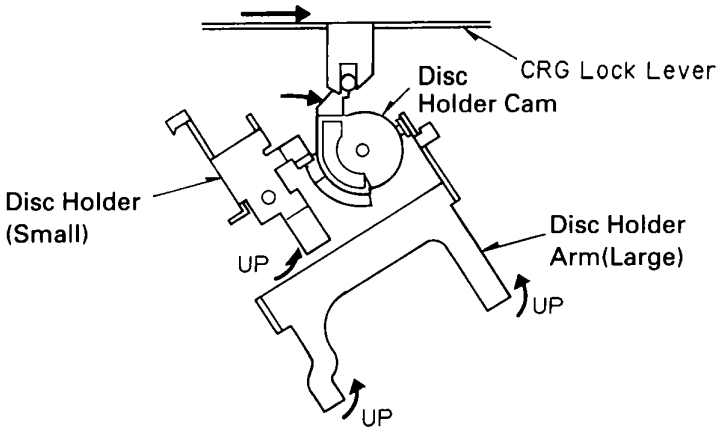

Fig.20

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● CRG Chassis Lock Release

1. After clamping is complete, the tray motor continues to turn, and begins the procedure to release the CRG chassis locks. The locations of the locks are indicated by ① ② ③ in fig. 21. Locks ① ② ③ are released almost simultaneously.

① The cam ring turns causing the arm to rotate. The contraction of the arm tip and the CRG lock lever's slot are interlinked. When the arm turns, the CRG lock lever slides, thus releasing the CRG chassis's lock (up/down direction).(Fig. 22)

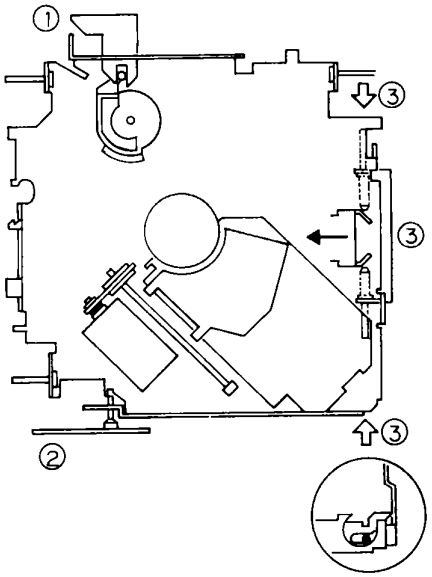

Fig.21

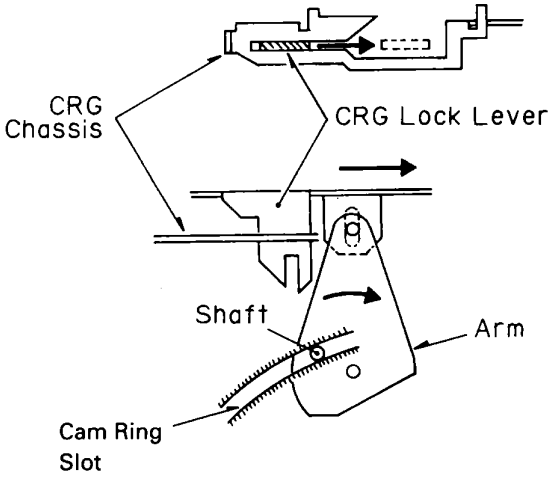

Fig.22

② The cam ring turns causing the link to be pushed, sliding the CRG lock lever, thus releasing the CRG chassis's lock (up/down direction).(Fig. 23)

③ The cam ring turns and the CRG lock lever slides. The tip of the lever inserted between the CRG chassis's shafts such that it is clamped by the shafts separates, thus releasing the CRG chassis's lock (front/rear direction).(Fig. 24)

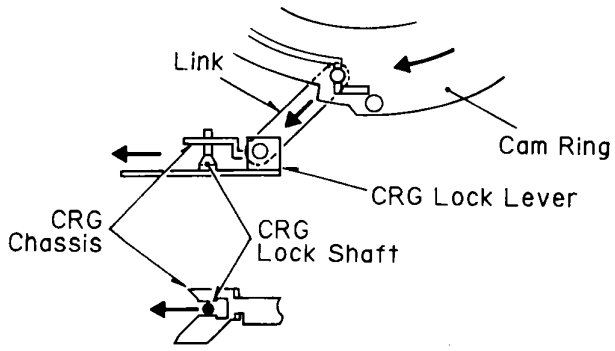

Fig.23

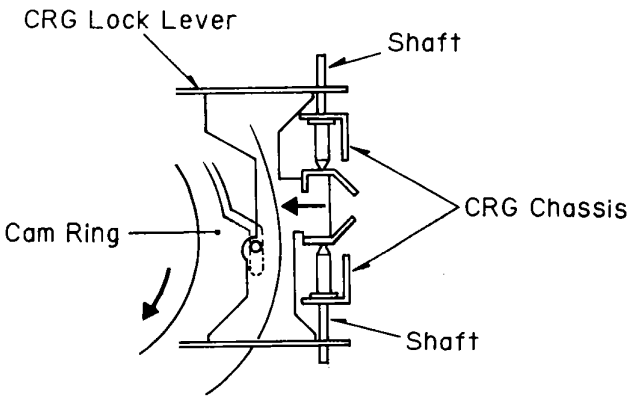

Fig.24

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2. Simultaneously with the operation described above, the CRG lock lever slides, the CRG lock arm swings, freeing the clamped shaft and releasing the CRG chassis's up/down and right/left locks.
   The operations described above release the locks of the CRG mechanism leaving it "floating."

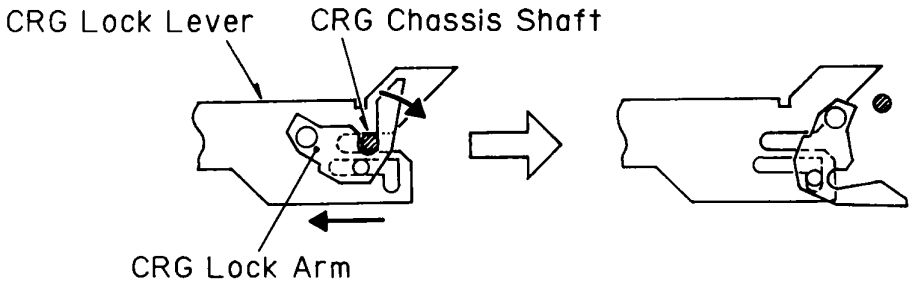

Fig.25

● **Stage Lock**

Looseness in the elevator mechanism is eliminated and vibration resistance is enhanced by locking the three (① ② ③) locations shown in fig. 26.

1. The CRG lock lever slides and pushes the stage lock lever. (Fig. 27)
2. The wedge shape of the lever tip is held in place by the square hole of the frame, and the stage mechanism is actuated in the left/right and up/down directions.(Fig. 27)

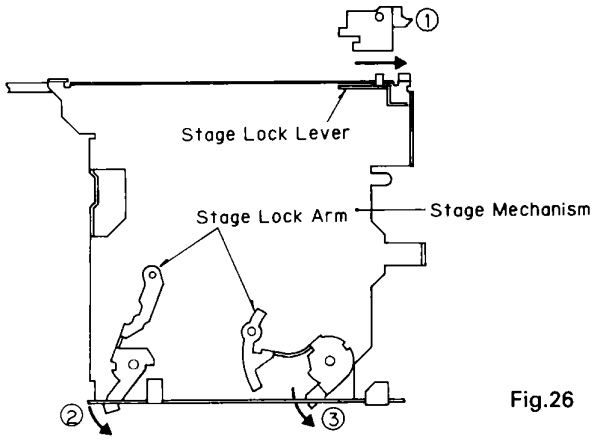

Fig.26

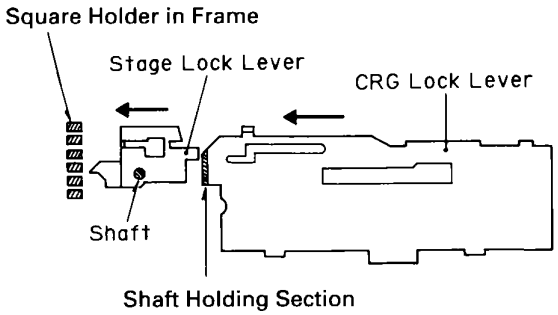

Fig.27

3. The rotation of the cam ring causes the stage lock arm to swing. The tip of the arm is held in place by the tapered part of the frame, and the stage mechanism is actuated in the left/right, up/down and front/rear directions.(Fig. 28,29)

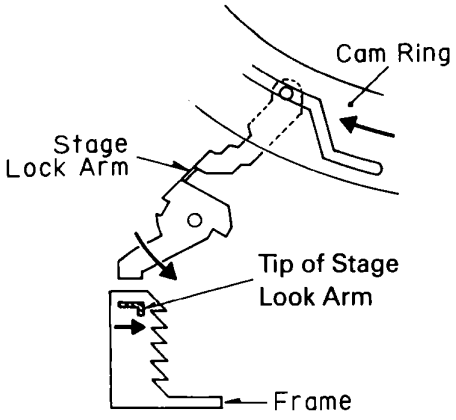

Fig.28

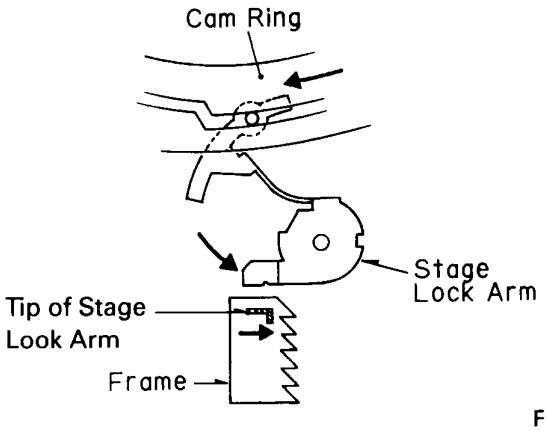

Fig.29

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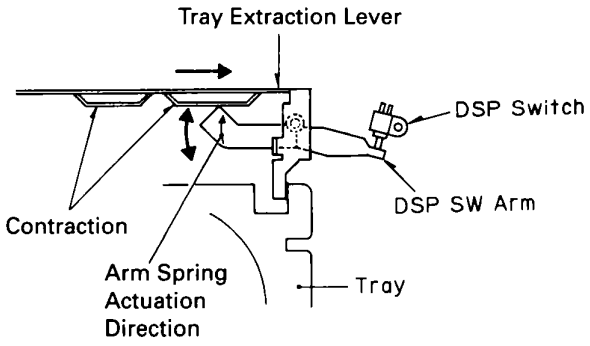
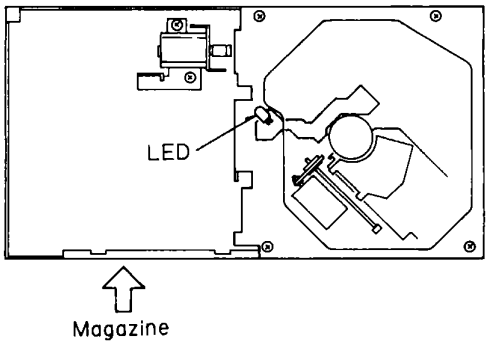
● **From Play to Tray Storage**

This operation is basically carried out in reverse of the operation from disc clamp to stage lock.

● **Disc Detection, Tray extraction/insertion Completion Detection**

The DSP switch is turned on and off by the contracting part of the tray extraction lever for extracting and inserting the tray, and the photosensor detects whether the tray contains a disc or not, and whether the disc is 8 or 12 cm, while being timed.





The photo-transistor is on the stage mechanism side and the LED is on the CRG mechanism side. The tray passes between the two.

Fig.30

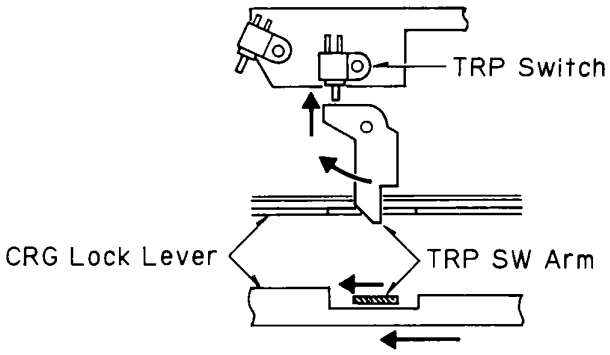
● **Tray extraction/insertion Completion Detection**

A) Play side(Fig. 31)

When play is complete, the CRG lock lever slides, pushing the tip of the TRP switch arm and turning the switch on.

B) Tray return side (eject side)(Fig. 32)

When tray return is complete, the tray extraction lever pushes the TRP SW lever, the TRP SW lever pushes the TRP SW arm, turning the TRP switch on.



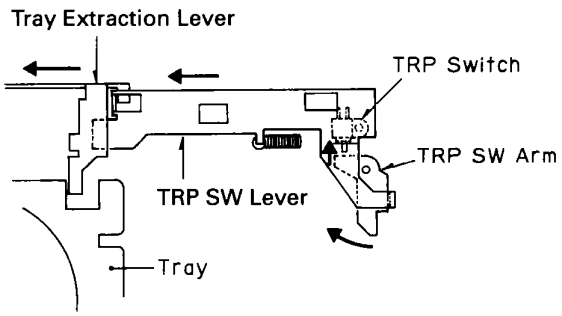


Fig.31

Fig.32

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● Elevator Operation

1. The inside steer slides when the ELV motor is driven. The front steer interlinked with the inside steer also slides. The shaft protruding from the stage mechanism is interrelated with the three front/rear stage holes, and the stage moves up or down when the steer slides. A gravitational force counter spring and front steer spring is provided on the magazine side arm in order to relieve the difference in load caused by gravitational force for rising and lowering.

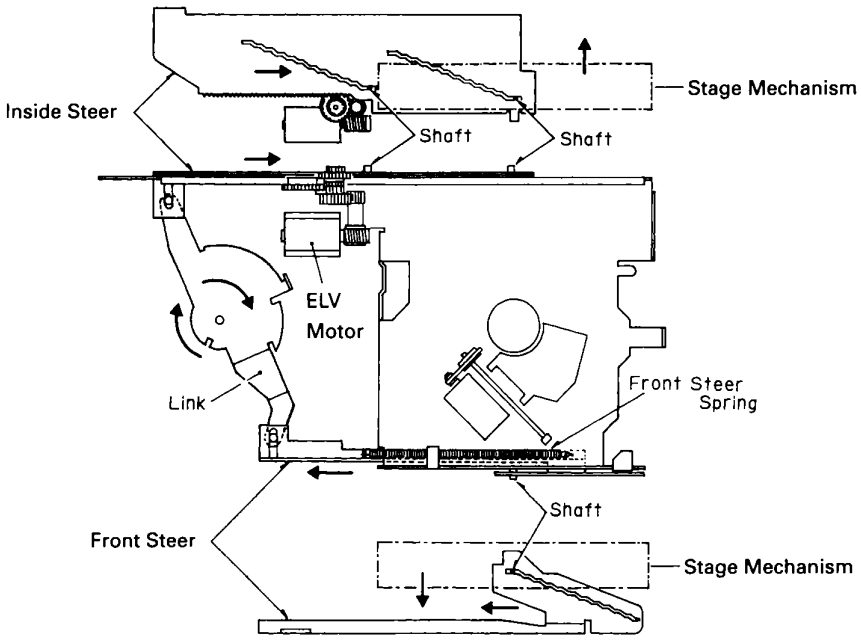

Fig.33

Gravitational force counter spring

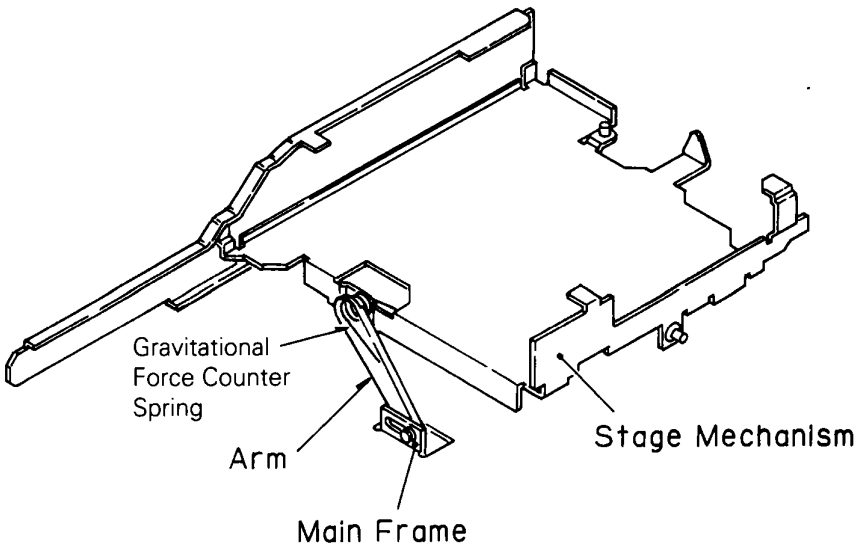

Fig.34

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● Elevaton Detection

1. The gear B operates intermittently by moving a step when the gear A turns half circle, then stopping at the straight part of the step hole of the steering. The gear A has holes (two places) at this stepping position and the phototransistor detects these holes (Fig. 35).
2. The phototransistor detects the top step immediately after the RSTP switch is turned to ON. When the steering moves further, the gear A turns half circle and the phototransistor detects the next position of the hole. Thus, the system detects the position of magazine ejection (Fig. 36).
   Mechanical reset is detected at the same position as with the position of the top step.

- After the RSTP switch is turned to ON, the system detects resetting when the steering moves upward again from the point when it moved downward and the RSTP switch was turned to OFF.
- Operation after magazine ejection is the same as with resetting after the RSTP switch is turned ON.

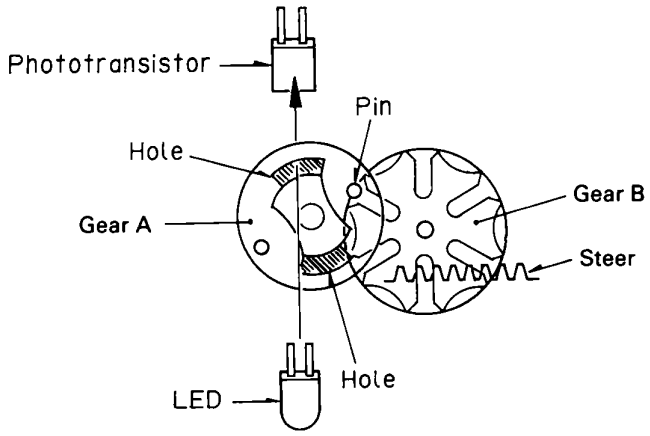


Fig.35

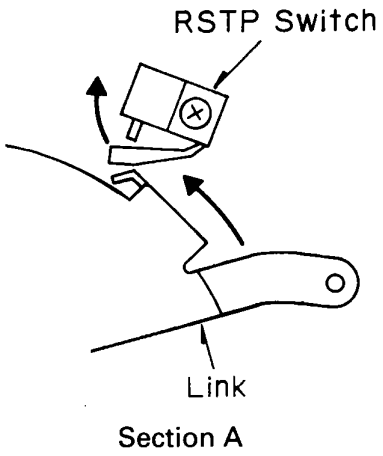
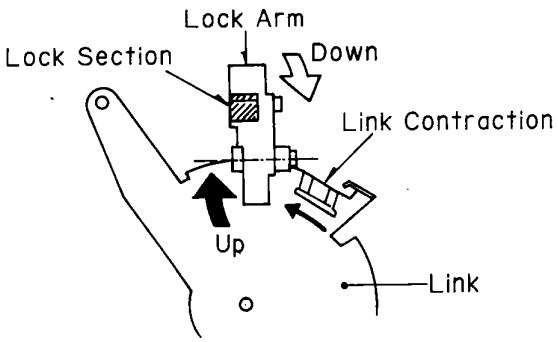


Fig.36

● Magazine Discharge

1. If the steer is further driven from the detection position of the elevator's highest stage, the contraction of the link pushes up the tip of the lock arm mentioned in "Magazine insertion." When it does, the lock part which is the tip of the other lock arm drops down below, releasing the magazine's lock. The magazine is discharged by the eject lever.



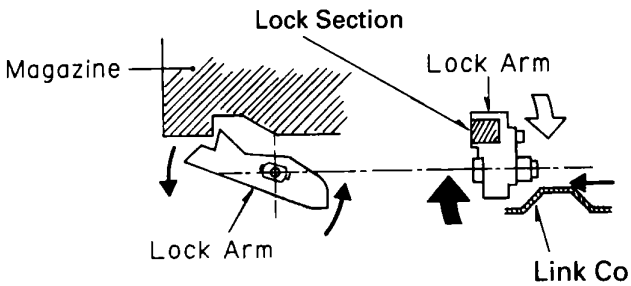


Fig.37

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